




UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,130	10/22/2001	Toshikazu Hamamoto	JG-YY-4993CIP / 500569.20	5234
26418	7590	03/02/2004	EXAMINER	
REED SMITH, LLP ATTN: PATENT RECORDS DEPARTMENT 599 LEXINGTON AVENUE, 29TH FLOOR NEW YORK, NY 10022-7650			RUTHKOSKY, MARK	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/021,130	Applicant(s) HAMAMOTO ET AL. 	
	Examiner Mark Ruthkosky	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 13-34 is/are allowed.
- 6) ☐ Claim(s) 1,3-7 and 10-12 is/are rejected.
- 7) ☐ Claim(s) 2,8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
6) <input type="checkbox"/> Other: _____ |
|---|--|

Art Unit: 1745

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 7, 10, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimitsu (US 4,888,255.)

The instant claims are to a non-aqueous secondary battery and an electrolytic solution for a battery wherein the electrolytic solution contains a substituted diphenyldisulfide derivative of a claimed formula in an amount of 0.01 to 5 weight percent based on the amount of electrolytic solution.

Yoshimitsu (US 4,888,255) teaches a non-aqueous electrochemical cell. The cell contains an anode, a cathode, an electrolyte and a separator (see example 1.) Charging and discharge of the cell are noted throughout the patent (including col. 7, lines 1-20.) An aromatic compound is added to the electrolyte solution (col. 3, line 60) that may be diphenyl disulfide and derivatives thereof including halogens (see col. 4, lines 9-18.) The amount of aromatic

Art Unit: 1745

compound is added in the amount of 0.01 mol/L (claims.) Solvent systems including propylene carbonate are noted in column 3. Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 5, 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takami et al. (US 5,340,670) in view of Yoshimitsu (US 4,888,255.)

Takami et al teaches a lithium secondary battery comprising as electrode assembly including a lithium intercalated carbonaceous anode, a lithium complex oxide cathode (claim 11) and a non-aqueous electrolyte including various lithium salts (claim 8) in a mixed solvent solution including ethylene carbonate and butyrolactone (claims 6 and 7.) The carbonaceous material has an interplanar distance in a length of 0.335 to 0.340 nm (claim 2.) Takami et al. (US 5,340,670) does not teach an additive to the electrolyte comprising a substituted diphenyl sulfide derivative. Yoshimitsu (US 4,888,255), however, teaches a non-aqueous electrochemical cell containing a lithium anode, a cathode, an electrolyte and a separator (see example 1.) An aromatic compound is added to the electrolyte solution (col. 3, line 60) that may be diphenyl disulfide and derivatives thereof including halogens (see col. 4, lines 9-18.) The amount of aromatic compound is added in the amount of 0.01 mol/L (claims.) It would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate the additive into the

Art Unit: 1745

cell of Takami et al. (US 5,340,670) in the cell of Yoshimitsu (US 4,888,255) as it would react with the surface of the electrode at the interface of the electrolyte and allow for the uniform release of lithium ions into solution upon discharge. This prevents a voltage drop at the initial stage of discharge of the cell as shown in Takami et al. (US 5,340,670).

Allowable Subject Matter

Claims 13-34 are allowed.

The following is an examiner's statement of reasons for allowance:

The instant claims are to a non-aqueous secondary battery and an electrolytic solution for a battery wherein the electrolytic solution contains a substituted diphenyldisulfide derivative of a claimed formula in an amount of 0.01 to 5 weight percent based on the amount of electrolytic solution. The electrolytic solution further contains a second additive as claimed in the independent claims, such as methyl 2-propyl-carbonate, cyclohexylbenzene or bis(4-methoxyphenyl)disulfide. The most pertinent prior art has been applied. Yoshimitsu (US 4,888,255) teaches a non-aqueous electrochemical cell comprising an anode, a cathode, an electrolyte and a separator (see example 1.) An aromatic compound, such as diphenyl disulfide and derivatives, is added to the electrolyte solution (col. 3, line 60, col. 4, lines 9-18) in the amount of 0.01 mol/L (claims.) The prior art does not teach adding a second additive to the electrolytic solution of Yoshimitsu.

Further, claims 2, 8, and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 1745

The following is a statement of reasons for the indication of allowable subject matter. While the prior art does teach a substituted diphenylsulfide derivative added to an electrolyte solution, it does not teach alkoxy or fluorinated alkyl groups as substituents as defined in claim 1. Thus, this class of compounds, as claimed, is allowable over the prior art as noted.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art not relied upon teaches batteries which use unsubstituted diphenylsulfide as an additive. These references give an indication of the state of the art with regard to disulfide additives.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

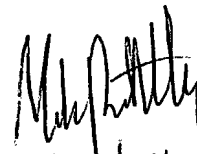
Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745


2/19/04